Levitin-Polyak well-posedness for vector optimization problems in linear spaces

In this report, we consider the vector optimization problems where the images of the objective maps are given in linear spaces not endowed with any topological structure.

Firstly, we propose new concepts of semicontinuity of vector-valued maps acting from metric spaces into linear ones and discuss their properties and characterizations. Next, using Zorn’s Lemma and these properties, we formulate existence conditions for such problems. Then, we introduce two notions of Levitin-Polyak well-posedness for the reference problems, and study
sufficient conditions for their fulfillment, as well as the relationships of these notions. Finally, using the Kuratowski measure of noncompactness, several metric characterizations of such well-posedness properties for vector optimization problems are investigated.